

REMARKS

Claims 1, 3, 4, 6-16, 18-22 and 24-30 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. According to the Examiner:

Amended claim 1 recites "wherein the efficiency-enhancing material" and the efficiency-enhancing material is not previously set forth in the claim. Accordingly, it is unclear if the efficiency-enhancing material is one of the previously recited materials (i.e., phosphorescent guest material, a hole- and electron transporting host material) or if the efficiency-enhancing material is a separate and distinct material. Since it is unclear if the compound is separate or further limits another recited material, the claim is considered indefinite. Clarification and/or correction are required.

The present amendment overcomes the Examiner's concern by providing the necessary antecedent basis for "the efficiency-enhancing material".

Claims 1, 3, 4, 6-16, 18-22 and 28-30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Seo et al. (US 2002/0086180 A1). According to the Examiner:

Seo sets forth organic luminescent elements comprising a bipolar-natured mixed layer comprising a hole transporting material and an electron transporting material (see abstract). The mixed region further comprises luminescent material (see par. 154 and 187). Seo sets forth an example comprising a bipolar mixed layer comprising 4,4'-N,N'-dicarbazole-biphenyl (referred to as "CBP") and hole transporting compound NPD (see par. 251, page 16). Light emitting material Ir(ppy)₃ is doped into the bipolar-natured mixed layer (see par. 252).

It is believed that the Examiner is overlooking the breadth of the teachings of the reference in arriving at an obviousness conclusion. It is noted that the reference teaches the use of a combination of an electron transport material and a hole transport material in a layer between the electrodes of an OLED device. The broad category of aromatic amine based compounds is suggested as one suitable hole transport material. Although MTDATA is among those specifically mentioned, so is α -NPD (alias NPB). The broad category of suitable electron transporting compounds paragraph [0184]. Essentially all

emitters are useful according to paragraph [0187]. Thus, it is clear that the invention of Seo is broad reaching and of broad scope as to the selection of the layer in which the mixture is to be included and as to the selection of each of the three components in the case a three component layer happens to be selected.

It is difficult to conclude that the claims of the present invention are obvious when the only instance of the specific selection of a three component system by Seo is demonstrated to be deficient in comparison to the selection of the present invention.

The Examiner is directed to the enclosed Declaration Under Rule 132. The Declaration firstly clarifies the triplet energy value applicable to MTDATA. The specification (page 12/ ln 16) quoted a literature value for the triplet energy for MTDATA as 2.42. Now, in accordance with the data in part I of the Declaration, it is confirmed that the value is more correctly 2.67. This distinction accounts for the difference in the efficiency obtained with MTDATA vs. α -NPD (alias NPB) for which the value is 2.41.

Turning now to section II of the Declaration, the efficiency of a pair of devices with a light-emitting layer containing (a) a triplet emitter, (b) a hole transporting material, and (c) an electron transporting material. In the device of the invention using MTDATA, the claim limitations are met. In the comparison, using NPB, they are not met. The result is that the efficiency of the device of the invention, as shown in Table 3, are far superior for Device 4 than for comparison devices 6 or 7. In fact, the results of Devices 6 and 7 are inferior to the use of no hole transporting material at all!

According to the Examiner,

Seo teaches MTDATA is an equivalent hole transporting material (see par. 183). Accordingly, it would have been obvious to one of ordinary skill in the art to have formed a device with a bipolar-natured mixed layer comprising CBP, Ir(ppy)₃ and MTDATA, because Seo clearly teaches MTDATA and NPD are similar hole transporting materials. Because Seo discloses the same materials as applicant, the properties of claim 1 are deemed to be inherently met by the reference.

The data discussed in the declaration is only based on one example of Seo et al. while Seo et al. may teach materials outside of the parameters claimed, applicant has not demonstrated unexpected results for picking materials based upon triplet energy values. The examiner notes that non-preferred embodiments can be indicative of obviousness (see In re Lamberti, 192 USPQ 278 (CCPA 1976);

In re Boe, 148 USPQ 607 (CCPA 1976); In re Kohler, 177 USPQ 399 (CCPA 1973)), and a reference is not limited to working examples (see In re Fracalossi, 215 USPQ 569 (CCPA 1982)). While Seo does not set forth an example using 4,4',4''-Tris [3methylphenyl] pheylamino] triphenylamine (referred to as MTDATA) in place of NPD, Seo teaches MTDATA is an equivalent hole transporting material (see par. 183). Seo renders obvious all of the required components of applicant's device.

It is believed that the data of the Declaration clearly overcomes the Examiner's stated presumption the NPB and MTDATA are "equivalent". Clearly, the two do not function in an equivalent manner in a light emitting layer. The one specific example that Seo selected to disclose his best mode of describing a light emitting layer does not inherently have the advantages of the present invention. There is no suggestion or motivation in Seo to make the selection of the present claims; the only specific selection is contra.

The present amendment should be entered as it places the claims in condition for allowance. The inaccuracy of the prior art regarding the triplet energy value of MTDATA was not appreciated prior to the outstanding final rejection. Upon discovery of the inaccuracy in the art, the present Declaration and Amendment were prepared promptly for submission.

In view of the foregoing amendments and remarks, the Examiner is respectfully requested to withdraw the outstanding rejection and to pass the application to allowance. Additionally, it is requested that the withdrawn claims be rejoined.

Respectfully submitted,



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If the Examiner is unable to reach the Applicant(s) Attorney at the telephone number provided, the Examiner is requested to communicate with Eastman Kodak Company Patent Operations at (585) 477-4656.